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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/737,334

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Richard A. Craig

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09/18/2006

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EXAMINER

PALABRICA, RICARDO J

ART UNIT

PAPER NUMBER

3663

DATE MAILED: 09/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/737,334

Applicant(s)

CRAIG ET AL.

Examiner

Rick Palabrica

Art Unit

3663

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 16-46 is/are pending in the application.
- 4a) Of the above claim(s) 21,23,24,35 and 38 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 16-20, 22, 25-34, 36, 37, and 39-46 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114.

Applicant's submissions filed on 6/30/06 and 5/24/06, which directly amended claims 16-18, 29 and 42, and traversed the rejection of claims in the 3/24/06 Office action, has been entered.

2. Applicant argues that the amended claims define over the applied art (Gomberg '142 and Schultz '626) in the 3/24/06 Office action. The examiner agrees; however the claims still do not define over other prior art, e.g., Gomberg '136, as discussed in section 7 below.

3. Applicant wonders why the elements, "upper level discriminator" (claim 19) and "vehicle with extension arm" (claim 42) do not have sufficient antecedent bases in their respective claims.

As to claim 19, the preamble recites a method for detecting hydrogenous materials. There is no proper antecedent for the upper level discriminator in the body of the claim because NOT all apparatus to exercise the method for detecting such

materials INHERENTLY include an upper level discriminator. The claim indefiniteness can be overcome, for example, by reciting, as part of the preamble, an apparatus that includes an upper level discriminator.

As to claim 42, the preamble recites a method whose intended purpose or objective is not even defined. There is no proper antecedent in the body of the claim for a vehicle with extension arm because NOT all apparatus to exercise the very broadly recited method INHERENTLY include such a vehicle.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 16-20, 22, 25-34, 36, 37, and 39-46 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The new matter pertains to the limitation, "detecting a thermalized neutron that is backscattered from hydrogen" (e.g., see claim 16). This limitation implies that detecting a single backscattered, thermalized neutron is sufficient to exercise the method. Contrary to this

statement, the specification clearly discloses that a plurality of such neutrons is required (e.g., see the specification on page 11, lines 7+, or page 12, lines 12+).

5. Claims 16-20, 22, 25-34, 36, 37, and 39-46 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

There is neither an adequate description nor enabling disclosure as to how and in what manner the method can be exercised by the detection of ONLY one thermalized neutron. See section 4 above.

6. Claims 19 and 42 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 19 recites the limitation "upper level discriminator setting", and claim 42 recites the limitation, "vehicle with extension arm". There are insufficient antecedent bases for these limitations in the claims. See section 3 above.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 16-20, 22, 25-34, and 43 are rejected under 35 U.S.C. 102(b) as being anticipated by Gomberg (U.S. 5,440,136).

Gomberg discloses a method for non-invasively assessing the composition of objects by scattering of neutrons (see Figs. 1-5 and col. 1, lines 6+).

As to the detection of hydrogenous materials Gomberg specifically states:

*"The system may be configured to detect beryllium, deuterium, tritium, and other materials characteristic of nuclear devices." Underlining provided. Col. 7, lines 65+.*

Note that deuterium and tritium are hydrogenous materials because they are isotopes of hydrogen.

As to claims 16, 25 and 29, Gomberg's method (see Fig. 1) includes: a) directing a stream of monoenergetic neutrons 14 from a neutron source 12 to a target 16; b) detecting a time when said neutrons are emitted from the source and detecting thermalized backscattered neutrons after a time delay, by a time-of-flight mode of operation (see col. 6, lines 15+); c) communicating the detected thermalized neutrons to a user (i.e., alarm). (Examiner's note: Gomberg's method inherently thermalizes the neutrons before being backscattered where the object being inspected contains deuterium and/or tritium).

As to claims 17, 26 and 30, the measurement after a time delay and a window, and disablement after the window, these are inherently performed as part of the time of flight measurement.

As to claims 20 and 22, a Gomberg's method detects hydrogenous materials and therefore also detects explosives and ordnance because they typically contain hydrogenous materials.

As to claims 18, 19, 27, 31 and 32, absent applicant's definition of "upper level discriminator setting," Gomberg's method reads on the measurement setting that excludes signals with energies or amplitudes higher than the signals from hydrogenous elements detected by the method.

As to claims 28, 33 and 34, Gomberg's neutron source has a collimator to focus the neutron beam at the target, which collimator provides spatial resolution of the neutron signal (see col. 5, lines 16+).

As to claim 43, applicant's claim language, "user interface" reads on analyzer 26.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 36 and 37 are rejected under U.S.C. 103(a) as being unpatentable over Gomberg (U.S. 5,440,136), hereinafter referred to as Gomberg '136, in view of Bartko (U.S. 3,832,545). Gomberg '136 discloses the applicant's claim limitations except for the specifics on the neutron source.

Gomberg '136 has been discussed above. He does not specify any particular type of neutron source. In fact, he teaches that a variety of neutron sources are well known in the art (see col. 5, lines 4+). This statement implies that conventional sources of fast neutrons can be used in his invention.

Bartko teach a method of detecting explosives using a Cf-252 as a source of fast neutrons because its size provides a high degree of utility and adaptability in the design of specific apparatus (see col. 2, lines 6+).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method, as disclosed by Gomberg '136, by the teaching of Bartko, to use Cf-252 as the fast neutron source, to gain the advantages thereof (i.e., good adaptability to apparatus), because such modification is no more than the use of a well known neutron source within the nuclear art.

9. Claims 39 and 40 are rejected under U.S.C. 103(a) as being unpatentable over Gomberg '136, in view of Kuan-Han Sun et al. (U.S. 2,994,769). Gomberg '136 discloses the applicant's claim limitations except for the specifics on the neutron sensor.

Gomberg '136 has been discussed above. He does not specify any particular type of neutron sensor. In fact, he teaches that his neutron detectors may comprise scintillation type detectors as are well known to those having skill in the art (see col. 5, lines 24+). This statement implies that conventional scintillation detectors of neutrons can be used in his invention.



Kuan-Han Sun et al. teach a Li-6 scintillator that is advantageous for detecting thermal neutrons because of its insensitivity to gamma and background radiation (e.g., see col. 2, lines 32+ and paragraph bridging cols. 2 and 3).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method, as disclosed by Gomberg '136, by the teaching of Kuan-Han Sun et al., to use a Li-6 scintillator as a thermal neutron sensor, to gain the advantages thereof (i.e., good discrimination of background radiation), because such modification is no more than the use of a well known expedient for detecting thermal neutrons within the nuclear art.

10. Claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gomberg '136, in view of either Hahn (U.S. 3,577,158) or Buchanan (U.S. 5,083,029).

Gomberg '136 has been discussed above. He teaches that his neutron detectors may include neutron shields to prevent spurious readings (see col. 5, lines 30+). He does not specify any particular type of neutron shield which implies that any convention neutron shield may be used for his invention.

Either one of Hahn or Buchanan teach a neutron shield comprising boron.

One having ordinary skill in the art would have recognized that all references are in the same field of endeavor and the teachings of Hahn or Buchanan would apply to the others. Note that the element boron disclosed in Hahn or Buchanan will inherently contain some  $^{10}\text{B}$  isotope because this isotope is found in natural boron.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus, as disclosed by Gomberg '136, by the teachings of either one of Hahn or Buchanan, to include a neutron shield comprising a material containing  $^{10}\text{B}$ , to reduce spurious readings, because such modification is no more than the use of conventional designs/techniques within the nuclear art.

11. Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gomberg '136, in view of Gomberg (U.S. 4,864,142). Gomberg '136 discloses the applicant's claim limitations except for a vehicle with an extension arm to support the sensing head.

Gomberg '142 teaches a mobile apparatus for detecting hydrogenous materials, wherein the sensing head is supported from a vehicle with an extension arm (see Fig. 5 and paragraph bridging cols. 14 and 15).

Both primary and secondary references are in the same field of endeavor, i.e., detection of hydrogenous materials.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus, as disclosed by Gomberg '136, by the teaching of Gomberg '142, to support the sensing head by an extension arm of a vehicle, to gain the advantage thereof (e.g., flexibility), because such modification is no more than the use of conventional designs/techniques within the nuclear art.

12. Claims 44-46 are rejected under 35 U.S.C. 103(b) as being unpatentable over either one of Gomberg '136.

As to the limitation in the claims regarding the value of the time delay, this is a matter of optimization within prior art conditions or through routine experimentation (see MPEP 2144.05 II.A). This time delay depends on a plurality of parameters, including the energy of neutrons emitted by the source, the detector/target configuration, the nature of the target, etc., and the combination of these parameters have to be selected for optimum operation.

### ***Conclusion***

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. References D-F further illustrate prior art.


14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rick Palabrica whose telephone number is 571-272-6880. The examiner can normally be reached on 6:00-4:30, Mon-Thurs.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RJP  
August 17, 2006

  
**RICARDO J. PALABRICA**  
**PRIMARY EXAMINER**